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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventors: Stougaard et al.

Serial No. 09/824,053

Filed : April 3, 2001



Examiner: Moore, William W.

Group Art Unit: 1652

U.S. Patent No.: 6,924,366

For: *Recombinant Hexose Oxidase, a Method of Producing Same and Use of Such Enzyme*

**ATTN: Certificate of Correction Branch
United States Patent and Trademark Office
Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314**

Certificate
MAY 02 2008
Correction

REQUEST FOR EXPEDITED ISSUANCE OF CERTIFICATE OF CORRECTION

PURSUANT TO 37 C.F.R. 1.322

Applicants respectfully request that a Certificate of Correction be issued to correct typographical errors in claims 6, 8 and 10 in the above-mentioned patent. The typographical errors were incurred by the U.S. Patent and Trademark Office. A copy of the claims presented in the Examiner's Amendment mailed May 19, 2004 and a copy of the Issue Classification indicating the renumbering of claims as issued in U.S. Patent No. 6,924,366 is attached at Attachment A.

With respect to claim 6 (original claim 11), the Examiner's Amendment deletes the word "said" from the claim. See attached Examiner's Amendment at p. 3, line 3 for support for this correction. With respect to claims 8 and 10 (original claims 66 and 68), both claims depend from original claim 11 (final claim 6). See attached Issue Classification at column 1 and Examiner's Amendment at p. 6 for support for this correction. The claim dependencies were not changed when U.S. Patent No. 6,924,366 issued.

A Certificate of Correction form, PTO/SB/44 is also submitted herewith.

Applicants do not believe that any fees are due with the filing as the errors were incurred by the USPTO. However, should any fees be required by this request, the Commissioner is hereby authorized to charge Deposit Account **19-4293**.

Respectfully submitted,

Date: 4-30-08

Steptoe & Johnson LLP
1330 Connecticut Avenue, NW
Washington, DC 20036-1795
Phone: 202-429-3000
Fax: 202-429-3902

A handwritten signature in black ink, appearing to read "Harold H. Fox".

Harold H. Fox
Reg. No. 41,498

**UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION**

PATENT NO. : 6,924,366
APPLICATION NO. : 09/824,053
ISSUE DATE : AUGUST 2, 2005
INVENTOR(S) : STOUGAARD *et al.*

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 67, line 15, the text "oxidase encoded by said DNA fragment, wherein the said" should read --oxidase encoded by said DNA fragment, wherein the transformed--.

Column 67, line 26, the text "hexose oxidase according to claim 11 to the food" should read --hexose oxidase according to claim 6 to the food--.


Column 67, line 40, the text "hexose oxidase according to claim 11 to the food" should read --hexose oxidase according to claim 6 to the food--.

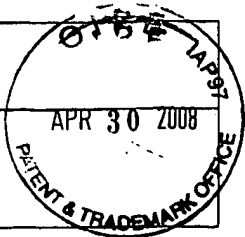
MAILING ADDRESS OF SENDER:

PATENT No. 6,924,366

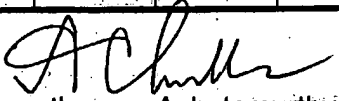
Steptoe & Johnson LLP
1330 Connecticut Avenue, NW
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ATTACHMENT A


Issue Classification 	Application No.	Applicant(s)	
	09/824,053	STOUGAARD ET AL.	
	Examiner	Art Unit	
	William W. Moore	1652	



ISSUE CLASSIFICATION												
ORIGINAL					CROSS REFERENCE(S)							
CLASS		SUBCLASS			CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)						
536		23.2			536	23.4						
INTERNATIONAL CLASSIFICATION					435	69.1	69.7	190	252.3	252.33	254.21	254.23
C	1	2	N	9/04	426	19						
C	1	2	N	15/53								
G	1	2	N	15/74								
C	1	2	N	15/79								
A	2	1	D	2/00								

William W. Moore 5/13/04 (Assistant Examiner) (Date)	 Ponnathapura Achutamurthy 5/13/04 (Patent Examiner) (Date)	Total Claims Allowed: 22
(Legal Instruments Examiner) (Date)		O.G. Print Claim(s) 1

<input type="checkbox"/> Claims renumbered in the same order as presented by applicant												<input type="checkbox"/> CPA		<input checked="" type="checkbox"/> T.D.		<input type="checkbox"/> R.1.47	
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		31		61		91		121		151		181				
	2	19	32		62		92		122		152		182				
	3	20	33		63		93		123		153		183				
	4	21	34		64		94		124		154		184				
	5		35	22	65		95		125		155		185				
	6		36	8	66		96		126		156		186				
	7		37	9	67		97		127		157		187				
	8		38	10	68		98		128		158		188				
1	9		39		69		99		129		159		189				
3	10		40		70		100		130		160		190				
6	11		41		71		101		131		161		191				
7	12		42		72		102		132		162		192				
14	13		43		73		103		133		163		193				
	14		44		74		104		134		164		194				
	15	17	45		75		105		135		165		195				
	16		46		76		106		136		166		196				
	17		47		77		107		137		167		197				
2	18		48		78		108		138		168		198				
	19		49		79		109		139		169		199				
	20	5	50		80		110		140		170		200				
	21	11	51		81		111		141		171		201				
15	22	12	52		82		112		142		172		202				
	23	13	53		83		113		143		173		203				
	24		54	16	84		114		144		174		204				
4	25		55		85		115		145		175		205				
	26		56		86		116		146		176		206				
	27		57		87		117		147		177		207				
	28	18	58		88		118		148		178		208				
	29		59		89		119		149		179		209				
	30		60		90		120		150		180		210				

	Application No.		Applicant(s)	
	09/824,053		STOUGAARD ET AL.	
	Examiner		Art Unit	
William W. Moore		1652		

Notice of Allowability

The MAILING DATE of this communication appears on the cover sheet with the correspondence address--
 All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed 9 February, and the interview conducted 5 May 2004.
2. ☒ The allowed claim(s) is/are 9-13, 18, 22, 25, 32-34, 45, 50-53, 58, 65-68 and 84.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 08/476,910.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date <u>20040505</u> . |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>03/03/04</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

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EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Cancel claims 1-8, 22, 26-31, 35-44, 46, 54, 62, and 69-83.

Rewrite claims 9-13, 18, 22, 25, 32, 34, 45, 50-53, 58, 65, 66, 68, and 84:

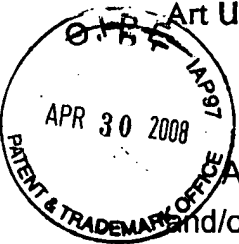
9. (Currently amended) An isolated DNA fragment comprising a DNA sequence encoding a *Chondrus crispus* polypeptide having hexose oxidase activity, said

~~Chondrus crispus~~ polypeptide comprising the internal peptide sequences:

- (i) Tyr-Glu-Pro-Tyr-Gly-Gly-Val-Pro (SEQ ID NO:1),
 - (ii) Ala-Ile-Ile-Asn-Val-Thr-Gly-Leu-Val-Glu-Ser-Gly-Tyr-Asp-~~X-X-X~~-Xaa-Xaa-Xaa-Gly-Tyr-~~X~~-Xaa-Val-Ser-Ser (SEQ ID NO:2),
 - (iii) Asp-Leu-Pro-Met-Ser-Pro-Arg-Gly-Val-Ile-Ala-Ser-Asn-Leu-~~X~~-Xaa-Phe (SEQ ID NO:3),
 - (iv) Asp-Ser-Glu-Gly-Asn-Asp-Gly-Glu-Leu-Phe-~~X~~-Xaa-Ala-His-Thr (SEQ ID NO:4),
 - (v) Tyr-Tyr-Phe-Lys (SEQ ID NO:5),
 - (vi) Asp-Pro-Gly-Tyr-Ile-Val-Ile-Asp-Val-Asn-Ala-Gly-Thr-~~X~~-Xaa-Asp (SEQ ID NO:6),
- and
- (vii) ~~X~~-Xaa-Ile-Arg-Asp-Phe-Tyr-Glu-Glu-Met (SEQ ID NO :8),

where ~~X~~ Xaa represents an amino acid selected from the group consisting of Ala, Arg, Asp, Cys, Gln, Glu, Gly, His, Ile, Leu, Lys, Met, Phe, Pro, Ser, Thr, Trp, Tyr, and Val.

10. (Currently amended) ~~A An isolated~~ DNA fragment according to claim 9 comprising the hexose oxidase (~~HOX~~) coding region set forth in ~~of sequence~~ SEQ ID NO:30.



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11. (Currently amended) A microbial host cell transformed with comprising a an isolated DNA fragment according to claim 9 and capable of producing the hexose oxidase encoded by said DNA fragment, wherein the said transformed microbial host cell is being selected from the group consisting of a bacterial cell, a fungal cell and a yeast cell.

12. (Currently amended) A microbial host cell comprising an isolated DNA fragment according to claim 11, wherein the said microbial host cell is being selected from the group consisting of an *E. coli* cell, a *Saccharomyces cerevisiae* cell and a *Pichia pastoris* cell.

13. (Currently amended) An isolated hexose oxidase A polypeptide encoded by an isolated DNA fragment produced according to a method of claim 51 9 where the hexose oxidase polypeptide encoded by the isolated DNA fragment is in a substantially non-glycosylated form.

18. (Currently amended) A An isolated DNA fragment according to claim 9 encoding a hexose oxidase which where the polypeptide encoded by the isolated DNA fragment oxidizes at least one sugar selected from the group consisting of D-glucose, D-galactose, maltose, cellobiose, lactose, D-mannose, D-fucose and D-xylose.

22. (Currently amended) An isolated, recombinantly-produced, hexose oxidase encoded by a DNA fragment according to claim 9 wherein the hexose oxidase where the polypeptide encoded by the isolated DNA fragment is in substantially non-glycosylated purified form.

25. (Currently amended) A nucleic acid sequence encoding a fusion polypeptide comprising a hexose oxidase encoded by a DNA fragment according to claim 9 additionally enzymatically active amino acid sequences.

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32. (Currently amended) A method of manufacturing a food product with a reduced sugar content utilizing a hexose oxidase (HOX) encoded by an isolated DNA fragment comprising,

(i) adding a hexose oxidase according to claim 13 to the food product prior to, during, or subsequent to a process step, and,

(ii) processing, storing, or packaging the food product comprising the hexose oxidase,

whereby the sugar content of the food product is reduced.

33. (Original) A method according to claim 32 wherein the food product is selected from the group consisting of a dairy product, a starch-containing product and a non-dairy product.

34. (Currently amended) A method ~~according to claim 32 wherein the polypeptide~~ of manufacturing a food product comprising an antioxidant comprising,

(i) adding a hexose oxidase according to claim 13 to the food product prior to, during, or subsequent to a process step, and,

(ii) processing, storing, or packaging the food product comprising the hexose oxidase,

whereby the hexose oxidase acts ~~is acting as an antimicrobial agent~~ or as an antioxidant.

45. (Currently amended) A composition comprising a ~~Chondrus crispus~~ hexose oxidase polypeptide encoded by the isolated DNA fragment according to ~~of~~ claim 13.

50. (Currently amended) A composition comprising a DNA fragment ~~the hexose oxidase (HOX) coding region of sequence (SEQ ID NO:30)~~ according to claim 10.

51. (Currently amended) A method of producing a ~~polypeptide having~~ hexose oxidase activity, comprising isolating or synthesizing a DNA fragment according to claim

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~~9 encoding the polypeptide, introducing the DNA fragment into a nucleic acid vector comprising an appropriate expression signal for expression of the encoded hexose oxidase the DNA fragment, transforming said DNA fragment into an appropriate a microbial host cell organism with in which the vector comprising the DNA fragment is combined with an appropriate expression signal for the DNA fragment, cultivating the transformed microbial host cell organism under conditions leading to expression expressing of the hexose oxidase, active polypeptide and recovering the hexose oxidase polypeptide from the cultivation medium or from the transformed microbial host cell organism.~~

52. (Currently amended) A method according to claim 51, wherein the hexose oxidase polypeptide is produced by a microbial host cell selected from the group consisting of a bacterial cell, a fungal cell and a yeast cell.

53. (Currently amended) A method according to claim 52, wherein the hexose oxidase polypeptide is produced by a host cell selected from the group consisting of an *E. coli* cell, a *Saccharomyces cerevisiae* cell and a *Pichia pastoris* cell.

58. (Currently amended) A composition according to claim 45, wherein the hexose oxidase polypeptide oxidizes at least one sugar selected from the group consisting of D-glucose, D-galactose, maltose, cellobiose, lactose, D-mannose, D-fucose and D-xylose.

65. (Currently amended) A composition ~~according to claim 45~~, comprising a fusion polypeptide comprising a hexose oxidase encoded by a DNA fragment according to claim 9 ~~additional enzymatically active amino acid sequences.~~

66. (Currently amended) A method of manufacturing a food product with a reduced sugar content ~~wherein an isolated DNA fragment according to claim 9 is used comprising,~~

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(i) adding a microbial host cell capable of producing a hexose oxidase according to claim 11 to the food product prior to, during, or subsequent to a process step, and,

(ii) processing, storing, or packaging the food product comprising the microbial host cell capable of producing a hexose oxidase,

whereby the sugar content of the food product is reduced.

67. (Previously Presented) A method according to claim 66, wherein the food product is selected from the group consisting of a dairy product, a starch-containing product and a non-dairy product.

68. (Currently amended) A method ~~according to claim 66 wherein the polypeptide encoded by the isolated DNA fragment is acting~~ of manufacturing a food product comprising an antioxidant comprising,

(i) adding a microbial host cell capable of producing a hexose oxidase according to claim 11 to the food product prior to, during, or subsequent to a process step, and,

(ii) processing, storing, or packaging the food product comprising the microbial host cell capable of producing a hexose oxidase,

whereby the hexose oxidase produced by the host cell acts as an antimicrobial agent or as an antioxidant.

84. (Currently amended) A ~~polypeptide having~~ hexose oxidase according to claim 13 wherein the hexose oxidase ~~activity comprising~~ has the amino acid sequence set forth in ~~of~~ SEQ ID NO:31.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Scott Yarnell on May 13, 2004.

The following is an examiner's statement of reasons for allowance:

The examiner's amendment is the product of several telephonic discussions with Applicant's counsel between April 5 and May 13, 2004. The amendment cancels claim 8 that would have described a composition of Sullivan et al., of record, comprising an

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isolated, native, *Chondrus crispus* hexose oxidase. Instead, the amendment rewrites claim 9 above to describe Applicant's essential contribution to the art, a disclosure that gives the public access, upon expiration of the patent grant, to any allele present in the genome of any member of the species *Chondrus crispus* encoding a hexose oxidase recognizable by the presence of amino acid sequences of the peptide regions listed in the claim, thus permitting the recombinant production of this versatile hexose oxidase in a host cell for isolation and use in industry and food preparation. Claims 35 and 69 that had described methods essentially redundant with methods of the preceding claims 34 and 68 are also canceled, as are claims 46, 54, and 62.

The examiner's amendment also clarifies the intended subject matters of several claims by, (1) stating in claim 9 the proper abbreviation for undesignated amino acids, "Xaa", used in the Sequence Listing filed with the instant application, (2) revising claim 13 to describe an isolated hexose oxidase recombinantly produced in a host cell that does not glycosylate the product, (3) revising claims 11, 12, 52, and 53 to more clearly describe the intended subject matters, (4) revising claim 22 to provide an alternative description of an isolated, non-glycosylated, hexose oxidase encoded by a DNA fragment of claim 9, (5) revising claims 32, 34, 66, and 68 to describe methods of manufacture according to disclosures at pages 6, 16 and 25 of the specification, to make claims 34 and 68 independent claims, and to permit claims 66 and 68 to describe methods that rely on microbial host cells comprising a DNA fragment encoding a hexose oxidase according to claim 9, (6) restating claim 25 to describe a nucleic acid sequence that encodes a fusion polypeptide comprising a hexose oxidase encoded by a DNA fragment according to claim 9, (7) restating claim 65 to describe a composition comprising a fusion polypeptide wherein the fusion polypeptide comprises a hexose

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oxidase encoded by a DNA fragment according to claim 9, and (8) generally providing a uniform format in recitations throughout the claims.


Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William W. Moore whose telephone number is now 571.272.0933. The examiner can normally be reached between 9:00AM and 5:30PM EST. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapura Achutamurthy, can now be reached at 571.272.0928. The fax phone numbers for all communications for the organization where this application or proceeding is assigned remains 703.872.9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is now 571.272.1600.

William W. Moore
May 13, 2004


PONNATHAPUACHUTAMURTHY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600